REMARKS

This amendment is responsive to the Office Action of July 11, 2003. Reconsideration and allowance of claims 1-17 and 22-24 are requested.

The Office Action

Claims 1, 2, 12-16, 22, and 23 stand rejected under 35 U.S.C. § 102 as being anticipated by Hayes (US 6,577,890).

Claims 3-11 and 17 were indicated as containing allowable subject matter.

Claims 18-21 were withdrawn from consideration as being non-elected claims after a restriction requirement.

Introduction

Hayes improves resolution in the data collecting step by optimizing the orbit which the detector follows during data collection. The present application improves resolution by electronically processing the already collected data with a resolution recovery algorithm.

The Prior Art

A SPECT camera has a collimator over the face of the detector head to control the direction and angle from which radiation events can be received. The collimator includes a series of bores which may be rectangular, circular, or other shapes. The depth and diameter or cross-section of each collimator bore control not only the direction from which radiation can be received but the cone angle from which radiation can be received. Due to this cone angle, when the detector head detects a radiation event which occurs close to the detector head, there is a relatively small cross-sectional area from which the radiation event might have occurred and still been received through the collimator bore. However, for radiation events further from the detector head, the area from which the radiation event might have come spreads by the cone angle and is much larger. This positional uncertainty for more

distant events leads to noise and blurring in the resultant image.

In order to minimize this loss of resolution, **Hayes** teaches that the camera head should be positioned as close as possible to the subject as it rotates around the subject. Hayes is directed to a technique for determining an optimum orbit which brings the detector head as close as possible to the patient. Because the patients are normally not circular in cross-section, optimizing the orbit has various considerations addressed in Hayes.

Because Hayes moves the camera head as close as possible to the subject, he has reduced blurring relative to detector heads which orbit further away from the subject.

The Present Application

The present application discloses a technique that supplements the Hayes technique and is performed in addition to it. Ideally, the Hayes technique is used to set the orbits of the detector heads. There is also a resolution loss due to rotational motion, particularly doing continuous rotate data collection. Projection data is typically binned into small angular increments spanning maybe 1-5°. All the data collected while the detector head is in this small increment is treated as if it were taken with the detector head in a stationary position. This could be viewed as increasing the cone angle in the rotational direction, which increases positional uncertainty in the collected data, even with an ideal orbit.

The present application is directed to an electronic data processing technique or algorithm to improve resolution after the data is collected, even data which is collected using the ideal Hayes orbit.

Thus, Hayes improves resolution by optimizing the orbit of the heads as data is collected. The present application improves resolution through electronic processing after the data has been collected.

The Claims Distinguish Patentably Over the References of Record

Claim 1 calls for a method of diagnostic imaging in which a plurality of projection data sets are collected. Once these electronic data sets have been collected, they are operated on by a resolution recovery algorithm. Rather than electronically processing data to recover resolution, Hayes optimizes the orbit before data collection commences. Accordingly, it is submitted that **claim 1**, dependent **claim 23**, and corresponding apparatus **claim 22** distinguish patentably and unobviously over the references of record.

Claims 3 and 4, which were indicated as containing allowable subject matter, have been placed in independent form. Accordingly, it is submitted that **claims 3 and 4** and **claims 5-11** dependent therefrom distinguish patentably and unobviously over the references of record.

Claim 12 has been amended to emphasize that the resolution recovery process is an electronic process performed on the collected data sets. Hayes improves resolution by optimizing the orbit before data is collected. Accordingly, it is submitted that **claim 12** and **claims 2, 13, 14, and 15** dependent therefrom, and corresponding apparatus claim 24 all distinguish patentably and unobviously over the references of record.

Claim 16 set forth details of the resolution recovery process including transforming into frequency space, deconvolution, and transforming the deconvolved data sets from frequency space back to image space. None of these steps are taught or set forth in the Hayes patent. Accordingly, it is submitted that **claim 16** distinguishes patentably and unobviously over the references of record.

Claim 17, which was indicated as containing allowable subject matter, has been placed in independent form. Accordingly, it is submitted that claim 17 is now in condition for allowance.

CONCLUSION

For the reasons set forth above, it is submitted that claims 1-17 and 22-24 now distinguish patentably over the references of record and comply with the other statutory requirements. An early allowance of all claims is requested.

Respectfully submitted,

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CERTIFICATE OF MAILING

I hereby certify that this **AMENDMENT C** in connection with U.S. Patent Application Serial No. 09/782,331 is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22213-1450 on this 10th day of October, 2003.

By: Hilary McNulty

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